

# Hans Reed Christensen Science Building Replacement July 2014



## BUILDING FACTS

- Built 1972 (42 years ago) with no significant remodeling since
- 708 FTE students in 1972 - currently 3,600 (with headcount of 4,600)
- 35,000 square feet
- Classroom/labs (5)
- Laboratories (4)
- Chemistry labs (2)
- General classrooms (4)
- Faculty offices (20)

## PROPOSED FY 2016 PROJECT

- Construction of a new 52,600 square foot state-of-the-art science center to replace the current science building on Snow's Ephraim campus
- \$13,636,382 Estimated construction costs (\$259.25/sq. foot)
- \$ 4,733,396 Estimated soft costs (\$89.99/sq. foot)
- \$18,369,778 Estimated total costs (\$349.24/sq. foot)

## SIGNIFICANT BUILDING DEFICIENCIES



- Seismic bracing needed to meet current earthquake code
- Structural crack and related concerns
- No fire sprinkler system—needs to be added for life safety to meet current building code
- Asbestos material abatement required for countertops in the labs, front lecterns, and asphalt floor tiles



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- Chemical storage space needs to be enlarged separating explosive and reactive chemicals
- Ventilation hood system in labs inadequate, noisy, inconsistent and does not meet current code standards
- Window glazing and frames need to be upgraded to current energy efficiency standards
- Green house improvements needed:
  - Floor crack allows water to leak into basement electrical room
  - Thin tube (heating system) beyond normal life expectancy and requires relocation above floor grade
- Glass, glazing and gaskets in need of replacement and to meet current energy efficiency standards



- Humidifier beyond normal life expectancy and in need of replacement
- Glass drain for chemical waste broken with flexible tube insert for repair—chemical vapor leaks in the system



- ADA improvements required:
  - Bathrooms on all floors to current ADA code
  - Stair handrails to current ADA code
  - Elevator size inadequate to accommodate all wheelchair types
- Sheathing on gas line for roof equipment in need of replacement
- Ceiling tiles throughout the building in need of replacement
- East and west air handlers and condensing units on the roof in need of replacement
- Relief air system throughout the building in need of replacement
- Water, gas, and air valves and racks are obsolete and new parts no longer manufactured



## FACULTY TEACHING CHALLENGES

- Washing and clean-up areas in the labs are challenging due to space limitations
- Bench design does not fit well with integrated teaching methods
- Safety equipment is obsolete
- Noise from equipment that has no place but the lab makes learning a challenge
- Instrumentation is difficult for students to organize and use due to outdated floor plan
- Inadequate space to organize supplies for each lab period
- Students obtaining supplies must pass by other students performing experiments
- Inadequate storage space for student's personal belongings
- Supplies are usually placed on moving carts; creating safety concerns
- Lab design precludes the design and use of safety shields
- Lack of floor level drains in safe areas makes spills difficult to clean up



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# Capital Development Projects

## Capital Budget Estimate (CBE)

<b>Project Name:</b>		New Science Building	
<b>Agency/Institution:</b>		Snow College	
<b>Project Manager:</b>		Kurt Baxter-Updated for New Construction	

  

Cost Summary	\$ Amount	Cost Per SF	Notes
Facility Cost	\$ 12,629,812	\$240.11	
Utility Fee Cost	\$ 84,764	\$1.61	
Additional Construction Cost	\$ 0	\$0.00	
Site Cost	\$ 921,807	\$17.52	
High Performance Building	\$ 0	\$0.00	
<b>Total Construction Cost</b>	<b>\$ 13,636,382</b>	<b>\$259.25</b>	
<b>Soft Costs:</b>			
Hazardous Materials	\$ 221,490		
Pre-Design/Planning	\$ 128,000		
Design	\$ 868,491		
Property Acquisition	\$ 0		
Furnishings & Equipment	\$ 2,225,000		
Information Technology:	\$ 200,000		
Utah Art (1% of Construction Budget)	\$ 126,298		
Testing & Inspection	\$ 135,000		
Contingency	\$ 642,026		
Moving/Occupancy	\$ 5,000		
Builder's Risk Insurance (0.15% of Construction Budget)	\$ 20,455		
Legal Services (0.1% of Construction Budget)	\$ 13,636		
DFCM Management	\$ 0		
User Fees	\$ 0		
Commissioning	\$ 103,000		
Other Costs	\$ 45,000		
<b>Total Soft Costs</b>	<b>\$ 4,733,396</b>	<b>\$89.99</b>	
<b>TOTAL PROJECT COST</b>	<b>\$ 18,369,778</b>	<b>\$349.24</b>	
<b>Previous Funding</b>	<b>\$ 0</b>		
<b>Other Funding Sources</b> (Identify in note)	<b>\$ 0</b>		
<b>REQUEST FOR STATE FUNDING</b>	<b>\$ 18,369,778</b>		

  

Project Information			
Gross Square Feet	52,600	Base Cost Date	16-Sep-13
Net Square Feet	35,000	Estimated Bid Date	30-May-15
Net/Gross Ratio	67%	Est. Completion Date	30-Dec-16
		Last Modified Date	9-Sep-13
		Print Date	10/7/13

# Capital Development Projects

## CBE Details

Project Name:	New Science Building
Agency/Institution:	Snow College
Project Manager:	Kurt Baxter-Updated for New Construction

Description	Explanation	Units	Unit Cost	Cost	Escalated Cost
<b>Facility Cost</b>		GSF			
<u>New Facility Cost Details:</u>					
	New addition/science labs	20,000	\$ 270	\$ 5,400,000	\$ 5,721,559
				\$ 0	\$ 0
	Classroom and Offices portion	32,600	\$ 200	\$ 6,520,000	\$ 6,908,253
				\$ 0	\$ 0
				\$ 0	\$ 0
				\$ 0	\$ 0
<b>Subtotal - New Facility Costs</b>		<b>52,600</b>	<b>\$</b>	<b>11,920,000</b>	<b>\$ 12,629,812</b>
<u>Remodel Facility Cost Details:</u>					
				\$ 0	\$ 0
				\$ 0	\$ 0
				\$ 0	\$ 0
				\$ 0	\$ 0
				\$ 0	\$ 0
				\$ 0	\$ 0
<b>Subtotal - Remodel Facility Costs</b>		<b>-</b>	<b>\$</b>	<b>0</b>	<b>\$ 0</b>
<b>TOTAL FACILITY COST</b>		<b>52,600</b>	<b>\$</b>	<b>11,920,000</b>	<b>\$ 12,629,812</b>

<u>Utility Cost Details:</u>					
	Water Utility Fee			\$ 0	\$ 0
	Sewer Utility Fee			\$ 0	\$ 0
	Electricity Utility Fee			\$ 0	\$ 0
	Storm Sewer Utility Fee			\$ 0	\$ 0
	Connection Fees (Impact Fees)	1	\$ 80,000	\$ 80,000	\$ 84,764
				\$ 0	\$ 0
<b>TOTAL UTILITY FEE COST</b>				<b>\$ 80,000</b>	<b>\$ 84,764</b>

<u>Additional Construction Cost Details:</u>					
				\$ 0	\$ 0
				\$ 0	\$ 0
				\$ 0	\$ 0
				\$ 0	\$ 0
				\$ 0	\$ 0
				\$ 0	\$ 0
<b>TOTAL ADDITIONAL CONSTRUCTION COST</b>				<b>\$ 0</b>	<b>\$ 0</b>

<u>Site Cost Details:</u>					
				\$ 0	\$ 0
	Site work	1	\$ 120,000	\$ 120,000	\$ 127,146
	Utility services	1	\$ 80,000	\$ 80,000	\$ 84,764
	Demo Old Science Bldg	1	\$ 320,000	\$ 320,000	\$ 339,055
	New Parking Lot	1	\$ 250,000	\$ 250,000	\$ 264,887
	Soils remediation	1	\$ 100,000	\$ 100,000	\$ 105,955
				\$ 0	\$ 0
				\$ 0	\$ 0
				\$ 0	\$ 0
				\$ 0	\$ 0
				\$ 0	\$ 0
<b>TOTAL SITE COST</b>				<b>\$ 870,000</b>	<b>\$ 921,807</b>

<b>HIGH PERFORMANCE BUILDING</b>	If N/A, change YES to NO. To supersede 1-1/2% calculation enter amount in unit cost	<b>NO</b>	<b>\$</b>	<b>0</b>	<b>\$ 0</b>
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<b>TOTAL CONSTRUCTION COST</b>	<b>\$ 12,870,000</b>	<b>\$ 13,636,382</b>
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<b>OTHER PROJECT INFORMATION:</b>	
Total Net Square Feet:	35,000
Base Cost Date:	9/16/13
Estimated Bid Date:	5/30/15
Estimated Completion Date:	12/30/16
Last Modified Date:	9/9/13
Inflation Escalation Factor Included:	3.50%
Location Factor Included:	0.00%

<b>Hazardous Materials Cost Details:</b>					
Pre-Construction Survey	Updated Alta & Topo	1	\$	4,000	\$ 4,000 \$ 4,140
					\$ 0 \$ 0
Plan and Monitoring		1	\$	10,000	\$ 10,000 \$ 10,350
					\$ 0 \$ 0
Abatement/Removal		1	\$	200,000	\$ 200,000 \$ 207,000
					\$ 0 \$ 0
<b>TOTAL HAZARDOUS MATERIALS COST</b>				<b>\$ 214,000</b>	<b>\$ 221,490</b>

<b>Pre-Design/Planning:</b>					
Planning Fund Reimbursement				\$	0
				\$	0
Programming	Programming	1	\$	120,000	\$ 120,000
				\$	0
Environmental Assessment				\$	0
				\$	0
Geotechnical Investigation/Surveys		1	\$	8,000	\$ 8,000
				\$	0
<b>TOTAL PRE-DESIGN/PLANNING COST</b>				<b>\$ 128,000</b>	

<b>Design Costs:</b>					
<u>A/E Design Fees</u>					
	Base Design Fee	6.00%	\$	715,200.00	\$ 715,200
	Additional Lab Design	1.00%	\$	119,200	\$ 119,200
				\$	0
				\$	0
				\$	0
Total A/E Design Fees				\$	834,400
Additional Printing Costs				\$	0
High Performance Design	If N/A, change YES to NO. To supersede 1/4% calculation enter amount in unit cost	<u>YES</u>		\$	34,091
Value Management Costs				\$	0
				\$	0
<b>TOTAL DESIGN COST</b>				<b>\$ 868,491</b>	

<b>Property Acquisition:</b>					
				\$	0
				\$	0
				\$	0
				\$	0
<b>TOTAL PROPERTY ACQUISITION COST</b>				<b>\$ 0</b>	

<b>Furnishings &amp; Equipment Costs:</b>					
<u>Furnishings Detail:</u>					
	Furnishings	1	\$	1,000,000	\$ 1,000,000
				\$	0
				\$	0
				\$	0
				\$	0
				\$	0
				\$	0
TotalFurnishings				\$	1,000,000
<u>Equipment Detail:</u>					
	Equipment	1	\$	1,200,000	\$ 1,200,000
				\$	0
				\$	0
				\$	0
				\$	0
				\$	0
TotalEquipment				\$	1,200,000
FF&E Design Costs		1	\$	25,000	\$ 25,000
				\$	0
<b>TOTAL FURNISHINGS &amp; EQUIPMENT COSTS</b>				<b>\$ 2,225,000</b>	

<b>Information Technology Costs:</b>					
	Non -DTS provided equipment only	1	\$	200,000	\$ 200,000
				\$	0
				\$	0
				\$	0
				\$	0

<b>TOTAL INFORMATION TECHNOLOGY COST</b>	<b>\$</b>	<b>200,000</b>
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<b>UTAH ART</b>	<small>If N/A, change YES to NO. To supersede 1% calculation enter amount in unit cost</small>	<b>YES</b>	<b>\$</b>	<b>126,298</b>
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<b>Testing &amp; Inspection Costs:</b>				
Building Code Inspection	1	\$	25,000	\$ 25,000
				\$ 0
Material Testing	1	\$	50,000	\$ 50,000
				\$ 0
Special Inspections	1	\$	60,000	\$ 60,000
				\$ 0
<b>TOTAL TESTING &amp; INSPECTION COSTS</b>			<b>\$</b>	<b>135,000</b>

<b>Moving/Occupance Costs:</b>				
	1	\$	5,000	\$ 5,000
				\$ 0
				\$ 0
				\$ 0
<b>TOTAL MOVING/OCCUPANCY COSTS</b>			<b>\$</b>	<b>5,000</b>

<b>DFCM Management:</b>				
			\$	0
			\$	0
			\$	0
			\$	0
<b>TOTAL DFCM MANAGEMENT</b>			<b>\$</b>	<b>0</b>

<b>User Fees:</b>				
			\$	0
			\$	0
			\$	0
			\$	0
<b>TOTAL USER FEES</b>			<b>\$</b>	<b>0</b>

<b>Commissioning:</b>				
Commissioning	1	\$	95,000	\$ 95,000
Blower test	1	\$	8,000	\$ 8,000
				\$ 0
				\$ 0
<b>TOTAL COMMISSIONING COSTS</b>			<b>\$</b>	<b>103,000</b>

<b>Other Costs:</b>				
Energy Study			\$10K if within RMP area, \$25K otherwise	
	1	\$	25,000	\$ 25,000
Integrated Modeling			Energy modeling for LEED and full building analysis	
	1	\$	20,000	\$ 20,000
				\$ 0
				\$ 0
<b>TOTAL OTHER COSTS</b>			<b>\$</b>	<b>45,000</b>

<b>Previous Funding:</b>				
<small>(Only show state appropriated funding &amp; include costs covered by that funding in appropriate category.)</small>				
			\$	0
			\$	0
<b>TOTAL PREVIOUS FUNDING</b>			<b>\$</b>	<b>0</b>

<b>Other Funding Sources:</b>				
<small>(List and describe each source)</small>				
			\$	0
			\$	0
			\$	0
			\$	0
<b>TOTAL OTHER FUNDING SOURCES</b>			<b>\$</b>	<b>0</b>





## STEM Strengths at Snow College

### Leadership Achievements in STEM

- Creation of a Natural Resources Program based on partnerships with government and private employers. Students combine coursework with hands-on experience in the field
- Our faculty have been leaders in studying and implementing tuning methodologies in both physics and mathematics
- Acquisition of NMR instrumentation—one of the few two-year institutions with such technological capability
- Team-teaching in STEM courses, especially the life sciences to provide students with special expertise in considering scientific concepts from multiple perspectives
- STEM initiative money has been used to offer broad coverage in engineering (chemical, electrical, mechanical and civil; computer information and engineering, and applied math courses

### Student STEM Outcomes

- 100% acceptance rate of Snow College students going to pharmacy school for the past five years
- Over the last 20 years, ten of the top graduating seniors in the USU engineering program have been Snow College engineering students. Several have been valedictorians
- Approximately 77% of all Snow College students take at least one STEM-related course (around 40% take 2 or more STEM-related courses). These courses are in the areas of Agricultural Science, Astronomy, Automotive Technology, Biology, Botany, Building Construction (including Traditional Building Skills) Chemistry, Diesel Mechanics Technology, Industrial Mechanics Technology, Machine Tool Technology, Nursing (including LPN and Certified Nurse Assistant), Computer Science, computer Information Science, Engineering, Forest Science (including Wildlife Resources), Geology, Health Science, Mathematics, Microbiology, Medical Technology, Natural Resources, Physical Science, Physics, Pre-Dentistry, Pre-Medical, Pre-Pharmacy, Pre-Veterinary, Pharmacy Technician, Statistics, and Welding Technology
- It is estimated that Snow College's enrollment will increase to 6,000 students within the next five years. Given the growth of the College and the proportion of students taking STEM-related courses, we will exceed the capacity of classroom and lab space in the Science Building during the same time frame
- For a given semester, STEM instruction accounts for 34% of the courses taught on both the Richfield and Ephraim campuses

- Approximately 1/3 of all Snow College students are STEM majors. This represents those students who have officially declared their major in a science, technology, engineering, or math related field.
- Roughly 60% of Snow College graduates obtain an Associate of Science or Associate of Pre-Engineering degree. A significant number of STEM majors graduate with an Associate of Arts degree. Sixty-four percent of these students transfer to a four-year program.
- Team teaching has resulted in increased classroom and lab teaching, not only for science students, but for non-science students as well
- We have implemented computer-based labs and multi-method teaching of Mathematics and are beginning to see great turn-around in student Math remediation. We recently received a completion grant award from USHE to further explore options for math learning
- While four-year schools have increased the rate of juniors and seniors involved in undergraduate research, we have extended research opportunities to first and second year students
- We are introducing distance science education courses that offer hands-on labs. Disciplines with this feature include chemistry, physical science and biology
- Our students are required to have field work as part of many STEM courses, even non-science majors. Work this past academic year included: a dinosaur dig in Grand Staircase-Escalante (Geology), Soil Science trip to Guatemala (Biology), Materials sample trip to Capitol Reef (Civil and Mining Engineering), Materials analysis at Redmond Salt Mine (physical geology and survey geology)
- Last month, seven of our nursing students attended the Health Occupations Student Association National Conference in Florida. Six students finished in the top ten for their respective areas of competition in medical photography, pharmacology, medical terminology
- Snow College fully supports the Board of Regents' 2020 Initiative

### Partnerships

- We partner with Ohio State University in holding an annual geology summer field camp. Snow is used as the base camp and provides labs and other space for OSU students and faculty in exchange for Snow student and faculty collaboration
- Snow College is the site for the 2015 Idaho-Utah American Association of Physics Teachers annual conference
- We partner with the U.S. Forest Service in operating the Great Basin Environmental Education Center (GBEEC). GBEEC's services include teaching about the environment of the region, and conservation techniques in general. GBEEC's efforts extend beyond Snow College to public schools, University and government researchers
- We have a math faculty member who serves as the chair of the Utah Math tuning committee. He also helped write the foundation piece for the Utah Middle School Math Project
- Our agriculture program partners with local ranchers and farmers in providing expert advice in agribusiness, agritechnology, and crop science
- Snow College has a farm immediately north of Ephraim that will begin offering community garden spaces for students and the general public beginning in 2015. The garden/farm will provide help with soil preparation, irrigation techniques, fertilizer application, and weed control
- Snow College hosts the annual Utah regional middle school and high school math contest
- Snow College hosts the annual Utah regional science Olympiad